Achieve

math works

Americans Need Advanced Math to Stay Globally Competitive

No student who hopes to compete in today's rapidly evolving global economy and job market can afford to graduate from high school with weak math skills. The benefits associated with improving the math performance of American students extend to the larger U.S. economy, as well.

Our students lag far behind other industrialized nations in math skills.

- U.S. math standards, assessments and textbooks are less focused and rigorous than those in top-performing nations.[1] By the end of 8th grade, what passes for the U.S. math curriculum is two years behind the math being studied by eighth graders in other countries.[2]
- America's 15-year-olds rank 25th out of 30 industrialized nations in math on a 2006 assessment. The performance gap is huge: Our students lag up to a full year behind those in high-performing countries.[3]
- We like to think our top students are the best in the world, but that's not the case either. On the 2006 assessment, our best math performers ranked 24th compared with top math students internationally.[4]
- Too few students are developing strong math skills. Fewer than 8 percent of American 15-year-olds have sophisticated math skills they can apply to solve real-world problems. Across developed nations that percentage is nearly twice as large and, in top-performing countries like Singapore and Norway, it is three to four times as large.[5]
- More generally, the U.S. is failing to produce enough science and engineering graduates. The number of four-year college science graduates per 100,000 employed 25-34-year-olds in the U.S. is 1,100, compared with 1,295 across developed nations and between 1,500 and 2,200 in countries like Australia, Ireland, the U.K. and Korea. Math is key to catching up: Students who take advanced math in high school perform significantly better in college science courses.[6]

STATE LEADERSHIP

While American students may still be lagging in math and science in comparison to their international peers, a number of states are taking major steps to close that gap:

- 20 states and the District of Columbia require students to complete advanced math, Algebra II, to graduate from high school.
- 21 states have adopted math standards aligned with postsecondary and business expectations.
- 14 states have joined together to administer a common Algebra II end-of-course exam, the largest multi-state assessment to date.

Requiring more students to take advanced math would boost America's economic competitiveness and wealth.

- The U.S. now ranks dead last among nations in four-year postsecondary "survival rates."[8] Since advanced math courses are the biggest predictor of college success, they can help the U.S. catch up on educational attainment as well.[7]
- By 2016, professional occupations are expected to add more new jobs—at least five million—than any other sector and within that category computer and mathematical occupations will grow the fastest.[9]
- Economists estimate that if the U.S. could improve its math and science achievement so that its students become globally competitive, the U.S. gross domestic product could eventually grow by an additional 36 percent.[10]

ENDNOTES

1 Organization for Economic Cooperation and Development. (2007). *OECD Economic Surveys: United States*. Paris, France: OECD Publications. (p. 115)

2 Schmidt, W. (2003, February 4). "Presentation to Mathematics and Science Initiative." Retrieved from www.ed.gov/print/rschstat/research/progs/mathscience/schmidt.html

3 Organization for Economic Cooperation and Development. (2007, December). *PISA 2006: Science Competencies for Tomorrow's World—Briefing Note for the United States*. Paris, France: Author.

4 Top math performers defined as those performing at the 90th percentile and 95th percentile in each nation. Strong American Schools. (2008). *A Stagnant Nation: Why American Students Are Still at Risk*. Washington, DC: Author. (pp. 10-11)

5 Organization for Economic Cooperation and Development. (2007, December). *PISA 2006: Science Competencies for Tomorrow's World—Briefing Note for the United States*. Paris, France: Author.

6 Organization for Economic Cooperation and Development. (2007) *Education at a Glance, 2007*. (Table A3.4).

7 Adelman, C. (2006, February). *The Toolbox Revisited: Paths to Degree Completion from High School through College*. Washington, DC: U.S. Department of Education.

8 Survival rate at the tertiary (or postsecondary) level is defined as the proportion of new entrants to the specified level of education who successfully complete a first qualification. Organization for Economic Cooperation and Development. (2007) *Education at a Glance, 2007*. (Table A3.6).

9 Dohm, A. & Shniper, L. (2007, November). Employment outlook: 2006–16. Washington, DC: Bureau of Labor Statistics. (p. 89)

10 Hanushek, E. A., Jamison, D. T., Jamison, E. A., & Woessmann, L. (2008, spring). Education and Economic Growth. *Education Next*, 8(2), 62-70.